(19) Japan Patent Office (JP)

(12) Publication of Unexamined Patent Application (A)

(11) Japanese Patent Laid-Open Number: Tokkaihei7-336778

(43) Laid-Open Date: Heisei7-12-22 (December 22, 1995)

(51) Int.Cl.⁶   Identification Code   Office Reference Number FI Technology

<div style="text-align:right">manifestation part</div>

H04Q   9/00   301 E

              311Q

              361

H04N   5/00   A

Request for Examination: No request to be done

Number of Claims: 46   OL (18 pages in total)

(21) Application Number: Tokuganhei 6-127628

(22) Filed: Heisei6-6-9 (June 9, 1994)

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(54) [Title of the Invention] Remote Controller, Personal digital assistance and Audio/Visual Device
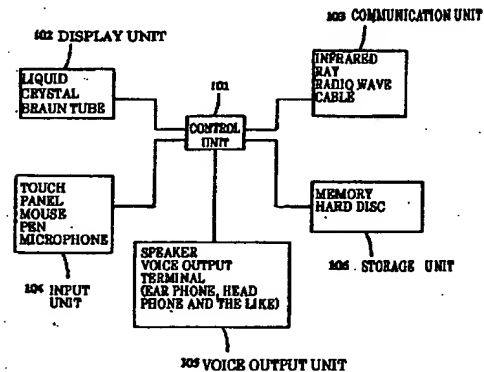
(57) [Abstract]

[Object] To provide a remote controller or a personal digital assistance which controls audio/visual devices collectively and to improved usabilities thereof.

[Constitution] Communication means, displaying means, input means, storage means, voice output means and a central processing unit are provided. Instructions or information is transmitted in the form of languages based on commands, statuses and specific grammars from/to the audio/visual devices.

[Effect] With no thought given to a position of the AV device, it is possible to control the AV device easily.

CONSTITUTION EXAMPLE OF INTELLIGENT AV REMOTE CONTROLLER (FIG. 1)

102 DISPLAY UNIT

103 COMMUNICATION UNIT

LIQUID CRYSTAL BRAUN TUBE

101

INFRARED RAY RADIO WAVE CABLE

CONTROL UNIT

TOUCH PANEL MOUSE PEN MICROPHONE

MEMORY HARD DISC

106 STORAGE UNIT

104 INPUT UNIT

SPEAKER VOICE OUTPUT TERMINAL (EAR PHONE, HEAD PHONE AND THE LIKE)

105 VOICE OUTPUT UNIT

[What is Claimed is]

[Claim 1] A remote controller, comprising:

communication means by cable or wireless such as infrared rays and radio waves;

display means such as liquid crystal, a Braun tube and the like;

input means such as a device for detecting an existence and strength of pressing by a pen or a finger, coordinates, or a continuous time, a mouse and a microphone;

storage means for storing various kinds of information; and

a central processing unit,

wherein a command or information is transmitted between the remote controller and a single or a plurality of audio/visual devices having communication means similar to that of the remote controller, by use of the communication means.

[Claim 2] The remote controller according to claim 1, wherein the command for controlling the audio/visual device, information such as an image or voice, and operation states of the audio/visual device and the remote controller are transmitted or received by use of the communication means between the remote controller and the single or plurality of audio/visual devices having the communication means similar to that of the remote controller, in a form of languages based on a specific grammar.

[Claim 3] The remote controller according to claim 2, wherein the remote controller has a conversion device or a conversion algorithm in the inside or outside thereof, which is for converting bidirectionally or unidirectionally the command, the information or the operation state according to claim 2, which has been transmitted or received by use of the communication means, and a language form based on the specific grammar.

[Claim 4] The remote controller according to claim 1, wherein a status representing operation states of the single or plurality of the audio/visual devices or a command operating the device is transmitted or received by use of the communication means between the remote controller and the single or plurality of the audio/visual devices having communication means similar to that of the remote controller.

[Claim 5] The remote controller according to claim 1, wherein image

information or voice information is transmitted or received by use of the communication means between the remote controller and the single or plurality of the audio/visual devices having the communication means similar to that of the remote controller.

[Claim 6] The remote controller according to claim 5, wherein the single or plurality of the audio/visual devices having the communication means similar to that of the remote controller according to claim 1 compress the image information or the voice information to transmit it to the remote controller and the remote controller decodes the compressed image information or voice information, which has been transmitted thereto.

[Claim 7] The remote controller according to claim 1, wherein means such as a camera for receiving image information or means such as a microphone for receiving voice information is provided.

[Claim 8] The remote controller according to claim 7, wherein the image information or the voice information inputted thereto is compressed or uncompressed to be transmitted to the single or plurality of the audio/visual devices having the communication means similar to that of the remote controller according to claim 1 or another remote controller similar to the remote controller according to claim 1.

[Claim 9] The remote controller according to one of claims 5, 6, 7 and 8, wherein the compressed or uncompressed image information or voice information is stored in the storage means or in a storage device connected to the outside of the remote controller according to claim 1.

[Claim 10] The remote controller according to claim 9, wherein the compressed or uncompressed image information or voice information, which has been stored, is read out.

[Claim 11] The remote controller according to claim 10, wherein the compressed image information or voice information, which has been read out, is decoded.

[Claim 12] The remote controller according to claim 1, wherein displaying is performed by the display means based on data transmitted from the single or plurality of the audio/visual devices having communication means similar to that of the remote controller.

[Claim 13] The remote controller according to claim 1, wherein voice output means such as a speaker, a voice output terminal and the like is provided.

[Claim 14] The remote controller according to claim 1, wherein a processing is executed for the input inputted by predetermined input means.

[Claim 15] The remote controller according to claim 1, wherein a command or information transmitted by use of the communication means is processed.

[Claim 16] The remote controller according to claim 1, wherein a processing is executed for the voice inputted by use of the input means.

[Claim 17] The remote controller according to claim 1, wherein when a command or various kinds of information is transmitted by use of the communication means, object device designation information, which is a transmission object, for the audio/visual device, or for another remote controller similar to that of the remote controller, is added to the command or the various kinds of information.

[Claim 18] The remote controller according to claim 1, wherein object device designation information for designating a device, which is a transmission object, is extracted from a command or various kinds of information, which has been received by use of the communication means.

[Claim 19] The remote controller according to claim 18, wherein it is decided by the object device designation information extracted whether the command or the various kinds of information according to claim 18, which has been received together with the object device designation information, is processed.

[Claim 20] The remote controller according to claim 19, wherein when it is decided by the object device designation information that the command or the various kinds of information according to claim 19 is not processed, the command or the various kinds of information is transmitted.

[Claim 21] A personal digital assistance, comprising:

communication means by cable or wireless such as infrared rays and radio waves;

display means such as liquid crystal, a Braun tube and the like;

input means such as a device for detecting an existence and strength of pressing by a pen or a finger, coordinates, or a continuous time, a mouse and a microphone;

storage means for storing various kinds of information; and

a central processing unit,

wherein a command or information is transmitted by use of the communication means between the remote controller and a single or plurality

of audio/visual devices having communication means similar to that of the personal digital assistance.

[Claim 22] The personal digital assistance according to claim 21, wherein the command for controlling the audio/visual device, information such as an image or voice, and operation states of the audio/visual device and the personal digital assistance are transmitted or received by use of the communication means between the remote controller and the single or plurality of audio/visual devices having the communication means similar to that of the personal digital assistance, in a form of languages based on a specific grammar.

]Claim 23] The personal digital assistance according to claim 22, wherein the remote controller has a conversion device or a conversion algorithm in the inside or outside thereof, which is for converting bidirectionally or unidirectionally the command, the information or the operation state according to claim 22, which has been transmitted or received by use of the communication means, and a language form based on the specific grammar.

[Claim 24] The personal digital assistance according to claim 21, wherein a status representing operation states of the single or plurality of the audio/visual devices or a command operating the device is transmitted or received by use of the communication means between the remote controller and the single or plurality of the audio/visual devices. having communication means similar to that of the personal digital assistance.

[Claim 25] The personal digital assistance according to claim 21, wherein image information or voice information is transmitted or received by use of the communication means between the remote controller and the single or plurality of the audio/visual devices having the communication means similar to that of the personal digital assistance.

[Claim 26] The personal digital assistance according to claim 21, wherein the single or plurality of the audio/visual devices having the communication means similar to that of the personal digital assistance compress the image information or the voice information to transmit it to the personal digital assistance and the personal digital assistance decodes the compressed image information or voice information, which has been transmitted thereto.

[Claim 27] The personal digital assistance according to claim 21, wherein means such as a camera for receiving image information or means such as a

microphone for receiving voice information is provided.

[Claim 28] The personal digital assistance according to claim 21, wherein the image information or the voice information inputted thereto is compressed or uncompressed to be transmitted to the single or plurality of the audio/visual devices having the communication means similar to that of the personal digital assistance according to claim 1 or another personal digital assistance similar to the personal digital assistance according to claim 1.

[Claim 29] The personal digital assistance according to one of claims 25 to 28, wherein the compressed or uncompressed image information or voice information is stored in the storage means or in a storage device connected to the outside of the personal digital assistance according to claim 21.

[Claim 30] The personal digital assistance according to one of claims 30, wherein the compressed or uncompressed image information or voice information, which has been stored, is read out.

[Claim 31] The personal digital assistance according to one of claims 30, wherein the compressed image information or voice information, which has been read out, is decoded.

[Claim 32] The personal digital assistance according to claim 21, wherein displaying is performed by the display means based on data transmitted from the single or plurality of the audio/visual devices having communication means similar to that of the personal digital assistance.

[Claim 33] The personal digital assistance according to claim 21, wherein voice output means such as a speaker, a voice output terminal and the like is provided.

[Claim 34] The personal digital assistance according to claim 21, wherein a processing is executed for the input inputted by predetermined input means.

[Claim 35] The personal digital assistance according to claim 21, wherein a command or information transmitted by use of the communication means is processed.

[Claim 36] The personal digital assistance according to claim 21, wherein a processing is executed for the voice inputted by use of the input means.

[Claim 37] The personal digital assistance according to claim 21, wherein when a command or various kinds of information is transmitted by use of the communication means, object device designation information, which is a transmission object, which is a transmission object, for the audio/visual device,

for the remote controller according to claim 1, or for another personal digital assistance similar to the personal digital assistance, is added to the command or the various kinds of information.

[Claim 38] The personal digital assistance according to claim 21, wherein object device designation information for designating a device, which is a transmission object, is extracted from a command or various kinds of information, which has been received by use of the communication means.

[Claim 39] The personal digital assistance according to claim 38, wherein it is decided by the object device designation information extracted whether the command or the various kinds of information according to claim 38, which has been received together with the object device designation information, is processed.

[Claim 40] The personal digital assistance according to claim 39, wherein when it is decided by the object device designation information that the command or the various kinds of information according to claim 39 is not processed, the command or the various kinds of information is transmitted.

[Claim 41] An audio/visual device, comprising:

communication means by cable or wireless such as infrared rays and radio waves,

wherein communication with a device such as an audio/visual device having communication means similar to that of the audio/visually device, a remote controller and a personal digital assistance is performed bidirectionally by use of the communication means.

[Claim 42] An audio/visual device, comprising:

communication means by cable or wireless such as infrared rays and radio waves,

wherein communication with an audio/visual device having communication means similar to that of the audio/visually device or a personal digital assistance is performed unidirectionally by use of the communication means.

[Claim 43] The audio/visual device according to one of claims 41 and 42, a conversion device or a conversion algorithm is provided in the inside thereof or in the outside thereof, which is for processing a command for controlling the audio/visual device in a form of language based on a specific grammar, information such as an image and a voice, or an operation state of the

audio/visual device, or a remote controller or a personal digital assistance having communication means similar to that of the audio/visual device, which has been transmitted or received by use of the communication means.

[Claim 44] The audio/visual device according to one of claims 41 and 42, wherein information part designating an object device is extracted from a command or various kinds of information designating the object device, which has been transmitted thereto.

[Claim 45] The audio/visual device according to claim 44, wherein by referring to the information part designating the object device, it is decided whether the command or the various kinds of information designating the object device, which has been transmitted thereto, is processed or not.

[Claim 46] The audio/visual device according to claim 45, wherein by referring to the information part designating the object device, when it is decided that the command or the various kinds of information designating the object device according to claim 45, which has been transmitted thereto, is not processed, the command or the various kinds of information designating the object device is transmitted to another audio/visual device, a remote controller or a personal digital assistance having communication means similar to that of the audio/visual device according to one of claims 41 and 42.

[Detailed Description of the Invention]

[0001]

[Field of the Industrial Application] The present invention relates to a remote controller, a personal digital assistance and an audio/visual device, and particularly to a system (a system obtained by suitably combining the remote controller, the personal digital assistance and the audio/visual device) which is used by users to control collectively and easily audio/visual devices in their household or the like.

[0002]

[Prior Arts] Nowadays, there are various audio/visual devices including a television set, a VTR and the like (hereinafter referred to as AV device) in household or the like. Many recent AV devices are operated by a remote controller even from a remote place, and the number of the remote controllers increases inevitably with an increase in the number of the AV devices. Thus, there is a disadvantage that operations of the AV devise become cumbersome. In order to solve such problem, learning type remote controllers in which

functions of plural remote controllers are installed therein have already been put on the market.

[0003] As a construction example of a system utilizing an infrared communication used in an ordinary remote controller, Japanese Patent Laid-Open No. Hei 2 (1990)-257731 gazette discloses means for allowing this system to be used also for a communication, a maintenance and a diagnosis by exchanging information, by constructing a radio communication network among a computer, a factory process controller and a handy terminal.

[0004]

[Subjects to be Solved by the Invention] However, users have to perform complicated setting operations previously for the above described learning type remote controller in many cases, and one button has a plurality of functions corresponding to AV devices which are operation objects. Accordingly, the above described learning type remote controller is not always easily operated. That is, there are many things which users must learn about the learning type remote controller. Furthermore, the learning type remote controller has a disadvantage that it is incapable of coping with too many AV devices in some cases, and that only a part of functions can be operated among operable functions of the AV devices.

[0005] The technology disclosed in Japanese Patent Laid-Open No, Hei 2(1990)-257731 gazette requires an infrared communication unit and a network device, and circumstances in which a network can be constructed by use of this system is limited. Specifically, to introduce this system into households only for watching and listening to the audience of the AV device is practically impossible.

[0006] The present invention was invented in consideration of the foregoing respects, an object of the present invention is to provide an intelligent AV remote controller which is capable of collectively controlling AV devices in a household by communicating the AV devices bidirectionally without introducing an enormous amount of investment and many dedicated devices, and which is capable of drastically improving usability of the AV devices for users by having an excellent user interface.

[0007]

[Means for Solving the Subjects] In order to achieve the foregoing object, the intelligent AV remote controller according to the present invention comprises

a communication unit by cable or wireless including infrared rays and radio waves, an input unit such as a pen, a mouse, or a touch panel for detecting pressing by a finger, a display unit such as liquid crystal, a Braun tube, a voice output unit, a storage unit for storing various settings, and a control unit for processing and controlling various data.

[0008]

[Operation] In the display unit, the intelligent AV remote controller displays various kinds of information to a user. On the other hand, the user selects a predetermined area with the input unit, whereby a user's intention is transmitted to this intelligent AV remote controller. Furthermore, the communication unit exchanges various kinds of information bidirectionally with other AV devices. The voice output unit outputs voice to the user. By providing these units in the intelligent AV remote controller, it is possible to exchange various kinds of information and intention with the outside thereof. A portion storing the various kinds of information is the storage unit, and a portion controlling all portions described above is the control unit.

[0009]

[Embodiments] Embodiments of the present invention will be described below with reference to the accompanying drawings. Fig. 1 is a block diagram showing a constitution of an intelligent AV remote controller according to one embodiment of the present invention.

[0010] As shown in Fig. 1, in the intelligent AV remote controller of this embodiment, as means for presenting information to a user, there are a display unit 102 such as a liquid crystal and a Braun tube, and a voice output unit 105 including a voice output terminal for an earphone, a head phone, a speaker of the like, or a built-in speaker or the like. An input unit 104 is provided to accept an operation of the user, and a touch panel, a mouse, a pen or the like is used as the input unit 104. For the convenience of the user for whom input by hand is difficult, input means such as a microphone and the like for inputting a voice may be provided in some cases.

[0011] In order to perform bidirectional communication with other AV devices, there is a communication unit 103. The communication unit 103 may adopt a wireless type by use of infrared rays or radio waves such as FM waves, and a cable type directly connected to the AV device by cables.

[0012] There is a storage unit 106 for storing various kinds of information

including various settings set by a user or setting of the AV device, and a memory, a hard disc or the like can be used. The storage unit can be provided also outside the intelligent AV remote controller.

[0013] It is a control unit 101 that controls each unit described above, analyzes and generates a script and data. Herein, the script describes procedures for controlling each element which is an operation object of the AV device, and is synonymous with a program. It is possible to give a feature to the intelligent AV remote controller, in which, by incorporating an interpreter for converting an interpretation and form of the script in the intelligent AV remote controller or providing it in the outside thereof, a communication with an AV device dealing with a script having a different form is enabled.

[0014] It is possible to give general-purpose devices generally called a personal digital assistance the same roll as that of the above described intelligent AV remote controller, because the general-purpose device can naturally exhibit the same function as that of the intelligent AV controller as long as the general-purpose device has the same constitution as that of the intelligent AV remote controller. Herein, the personal digital assistance means the one that has the same constitution as that of the intelligent AV remote controller according to the present invention, and that can perform an operation other than a control by the AV device described here. Thus, an advantage that the AV device can be controlled by the above described personal digital assistance utilized for various applications is brought about. At this time, the personal digital assistance may be originally provided with such function, or the above described function is not changed also by adopting such a style that a program and an interface to control the AV device are added later on. Therefore, in the following all embodiments and drawings, the contents of the descriptions in this specification do not change even when the intelligent AV remote controller is replaced with the above described personal digital assistance.

[0015] Fig. 2 is a diagram showing an example of an external appearance of the above described intelligent AV remote controller. In this example, as shown in Fig. 2, there is a liquid crystal display-cum-touch panel 201, which serves both as the display portion and an input portion operated by fingers or the like. Furthermore, in order to perform a communication with the AV device, an infrared interface 202, a radio wave interface 203, and a cable

connector 204 are provided, and the intelligent AV remote controller is compatible with a communication by wireless (radio wave, infrared ray) or cable. As described above, by providing the plurality of communication interfaces, an advantage is brought about, in which the intelligent AV remote controller can cope even when a plurality of communication means used by the AV device simultaneously exist. As a matter of course, the function never changes when only one communication interface is provided. Then, as voice output means, an earphone jack 205 for connecting an earphone, a head phone or the like, and a speaker 206 are provided.

[0016] Fig. 3 explains the communication between the intelligent AV remote controller 301 and the AV device 302. The communication between the intelligent AV remote controller 301 and the AV device 302 means exchanges of a command or a status, a script and data ordinarily. The intelligent AV remote controller 301 and the AV device 302 perform the communication:

(A) when the intelligent AV remote controller performs a confirmation for the existence and operation of the AV device (303A);

(B) when the intelligent AV remote controller performs the control of the AV device (303B);

(C) when the AV device wishes to transmit certain information to the intelligent AV remote controller (303C); and the like.

[0017] First, the case of (A) corresponds to 303A of Fig. 3, and this is performed when an operation of the intelligent AV remote controller starts and performed at regular time intervals. The time at which the operation of the intelligent AV remote controller starts means a time at which the user turns on an operation start switch of the intelligent AV remote controller, or a time at which a predetermined operation determined so as to start the operation is performed. The confirmation of the existence and operation of the AV device, which is performed at regular time intervals, is to confirm whether the AV device exists within a communication range of the intelligent AV remote controller. Furthermore, if the AV device exists within that range, the confirmation thereof is to confirm what operation the AV device is performing. The intelligent AV remote controller is excellent in portability, and when the user moves while carrying the intelligent AV remote controller, this confirmation is means for coping with a possibility of occurrence of AV devices incapable of communication. However, this confirmation needs not to

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be performed at regular time intervals, but may be performed in response to a certain operation.

[0018] Next, a communication content of the foregoing 303A will be described. First, the intelligent AV remote controller scans around itself by use of communication means. Upon scanning, a response comes back from the AV device. In this case, procedures in which the intelligent AV remote controller sends out AV device confirmation command or a script, and the AV device on a controlled side sends out data and the like in response to this may be adopted. Alternatively, procedures in which the device on the controlled side sends out data and the like continuously or intermittently, and the intelligent AV remote controller receives the data and the like may be adopted. At this time, the data sent out from the AV device on the controlled side is a device ID of the AV device, a script in which procedures for controlling elements of the AV device that can be controlled are described, or other data. As an example of the device ID of the AV device, a type of the AV device, a product name, a maker, a manufacture number and the like are enumerated. Furthermore, when the AV device is a VTR, the things that can be controlled are functions such as a play, a fast-rewind, a fast-forward, a pause, a stop, and recording, and a script corresponding to these is sent from the AV device. At the same time, icon data for displaying buttons of the respective functions on a screen of the intelligent AV remote controller may be sent out from the AV device. As one of other data, icon data for indicating the AV device on the intelligent AV remote controller may be sent out.

[0019] Next, the content of 303B of Fig. 3 in the case of the foregoing (B) will be described. When the user designates the operation of the AV device on the intelligent AV remote controller, or when the user recognizes that the intelligent AV remote controller is necessary, communication is performed between the intelligent AV remote controller and the AV device. At this time, an ID of the AV device that is a control object, an ID of an object that is a control object, an execution script to the object and data are sent out to the AV device from the intelligent AV remote controller. Thus, the user can operate the AV device. On the other hand, in response to this, a status or a script, which expresses a present operation state, is sent out from the AV device to the intelligent AV remote controller.

[0020] Furthermore, when an image of a TV is displayed on a screen of the

intelligent AV remote controller, or when voice is outputted from a voice output device such as a speaker built in the intelligent AV remote controller and a head phone connected to a voice output terminal, an image and voice data are uncompressed or compressed, and then can be also sent out from the AV device to the intelligent AV remote controller solely or together with the foregoing operation state status.

[0021] Finally, the content of 303C of Fig. 3 in the case of the foregoing (c) will be described. In the 303C, when abnormality of some kind occurs in the AV device, a status or a script notifying the occurrence of the abnormality is sent out from the AV device to the intelligent AV remote controller. When the user needs to know the occurrence of the abnormality, the intelligent AV remote controller displays the abnormality on its screen in response to the script and the like, whereby the user can know the occurrence of the abnormality even when the user is not present near the AV device causing the abnormality. Furthermore, when the foregoing abnormality is displayed on the screen, a countermeasure is displayed simultaneously on the screen, whereby a feature that the user can remove the abnormality without confusion can be obtained. The above described countermeasure may be stored in the intelligent AV remote controller by a way of some kind, or the countermeasure may be included in a script which, when the AV device notifies the abnormality, is sent to the intelligent AV remote controller. Furthermore, when the intelligent AV remote controller counters the abnormality of the AV device, the intelligent AV remote controller sends out a script for the countermeasure to the object AV device. For example, in the case where a CD is inserted into a CD player, when the inserted CD is not recognized because of occurrence of an error of some kind, the CD player makes a script in which the occurrence of the abnormality and the countermeasure are described, and transmits it to the intelligent AV remote controller. When the content of the countermeasure is that a tray of the CD player is once opened and closed again, and the recognition of the CD is tried again, the intelligent AV remote controller which has received the script transmits a script to the CD player, which notifies that the operation should be performed. At this time, the intelligent AV remote controller displays a message to the effect that the abnormality has occurred on its screen, and can encourage the user to wait.

[0022] There are several methods to construct a system in which the

intelligent AV remote controller and the AV device on the controlled side are incorporated. First, the AV device includes the one configured to be capable of communicating bidirectionally between the AV devices and between the intelligent AV remote controller and the AV device, and the one configured to be incapable of communicating between the AV devices or configured to perform no communication between the AV devices. Herein, the AV device incapable of communicating between them represents conventional AV devices which can be operated by a remote controller. With respect to the AV devices which can perform the bidirectional communication, also a system construction in which a part of the AV devices alone perform the bidirectional communication with the intelligent AV remote controller can be adopted. Such system construction is extremely effective when all of the AV devices are not in the state where they can communicate with the intelligent AV remote controller bidirectionally. Accordingly,

(a) : a case where all of the AV devices perform the bidirenctional communication with the intelligent AV remote controller,

(b) : a case where a part of the AV devices perform the communication with the intelligent AV remote controller,

(c) : a case where the intelligent AV remote controller constructs a system together with the AV devices which are incapable of performing the bidirectional communication are shown below.

Note that the communication described here shall be any of ones by wireless such as infrared ray and radio waves or by cables.

[0023] Fig. 4 is an example of a system construction in the case of the first item (a) described above, in which the AV device capable of the bidirectional communication and the intelligent AV remote controller construct a system. Such propagation paths of the information are realized when all of the AV devices and the intelligent AV remote controller exist in the same room.

[0024] As the AV devices on the controlled side, a television 408 including a satellite broadcasting and a cable television, a stereo 409 including a CD player, a tuner, a cassette deck, a DAT deck, an MD deck, a DDC deck, a record player and an amplifier, a VTR 407, and an LD player 410 are enumerated. As a matter of course, existence of other AV devices 411 is not cared at all. Existences of the plurality of the AV devices of such kind are not also cared at all. In the example of Fig. 4, the stereo 409, the TV 408, the

VTR 407, the LD player 410 and other AV devices 411 communicate separately with the intelligent AV remote controller 401, and the respective AV devices are capable of the bidirectional communication with other AV devices.

[0025] A mouse 402 and a pen 403 on the intelligent AV remote controller 401 side are similar to a mouse and a pen in the input unit 104 of Fig. 1, and are provided when input means such as a touch panel is not incorporated in the intelligent AV remote controller. The head phone 404, the earphone 405 and a speaker 406, which are voice external output means, are respectively similar to the head phone, the earphone and the speaker in the voice output unit 105 of Fig. 1, and can be connected to a voice output terminal when the voice output terminal is provided in the intelligent AV remote controller.

[0026] In the case of the system constitution as described in Fig. 4, since the intelligent AV remote controller 401 performs the communications with the respective AV devices, this system constitution has a feature that a time difference between the transmission of the information and the start of the operation of the AV device to which the information is transmitted among the respective AV devices is small. Furthermore, in this constitution, instead of conventional cables and the like for sending out voice and image signals, it is possible to transmit and receive the voice and the image signal by the communication among the AV devices of this system, and troublesome wirings among the devices are never necessary at all. This system is very easily usable for the user.

[0027] Fig. 5 is an example of a system constitution in the case of the second item (b) described as above. Also in the case of the example of the system constitution shown in Fig. 5, the AV device on the controlled side may be diverse as in the case of Fig. 4, and may be plural. The mouse 502, the pen 503, the head phone 504, the earphone 505 and the speaker 506 connected to the intelligent AV remote controller 501 are similar to the mouse, the pen, the head phone, the earphone and the speaker of Fig. 1, described above. Herein, the example is shown, in which all of the AV devices performs the bidirectional communications with the intelligent AV remote controller 501 via the television 507, and the stereo 508, the LD player 509, the VTR 510, and other AV devices 511 perform the communications with the television 507, respectively. The communication means at this time may be wireless or cable

as described above.

[0028] By adopting the system constitution described in Fig. 5, the following effects can be brought about. Even when a certain AV device is in a state where it cannot directly communicate with the intelligent AV remote controller 501, for example, even when the television 507 and the intelligent AV remote controller 510 exists in the same room and the stereo 508 exists in a different room, the intelligent AV remote controller 501 can control the stereo 508 via the television 507. This can be realized by the procedures in which a script and the like are first transmitted from the stereo 508 to the television 507, and the television 507 which has received the script of the stereo 508 transmits it to the intelligent AV remote controller 501. Furthermore, reverse procedures are also possible.

[0029] Furthermore, for example, a method can be adopted, in which only the television 507 among the AV devices on the controlled side has an interpreter for interpreting the script, the script is exchanged between the intelligent AV remote controller 501 and the television 507, and a command used in a conventional remote controller is exchanged between the television 507 and each of other AV devices. According to this method, a feature is brought about, in which not all of the AV devices need to have the interpreter, and simplification of a circuit of the AV device can be achieved. Furthermore, as in the case of Fig. 4, it is also possible to transmit and receive a voice and an image signal by the communication of this system.

[0030] Fig. 6 is an example of a system constitution in the case of the above described item (3). In Fig. 3, a system is constructed by the intelligent AV remote controller 601 and the AV devices of two kinds. One is incapable of the bidirectional communication, and the other does not perform the bidirectional communication. The AV device on the controlled side may be diverse as in the case of Fig. 4, and may be plural. In the example of Fig. 4, however, the stereo 607, the TV 608, the VTR 609, the LD player 610 and other AV devices 611 individually perform communications with the intelligent AV remote controller 601. Furthermore, the mouse 602 and the pen 603, which are external input means of the intelligent AV remote controller 601, are similar to the mouse and the pen of Fig. 1, and the head phone 604, the earphone 605, and the speaker 606, which are voice external output means, are similar to the head phone, the earphone and the speaker of

Fig. 1 described above, respectively.

[0031] A merit obtained by constructing the system as shown in Fig. 6 is that the system can be constituted together with the AV devices incapable of the bidirectional communication among the devices. When the system is constituted by the conventional AV devices operated by remote controllers and the intelligent AV remote controller 601, the intelligent AV remote controller 601 operates as a comprehensive remote controller which controls the AV device based on data previously inputted, or as a learning type remote controller which comes to be capable of controlling a certain AV device by storing the operation of the remote controller afterward, which is present initially in the AV device. However, a feature different from that of a conventional remote controller is that the intelligent AV remote controller 601 comprises an excellent user interface as described later. Specifically, the example in which the system is constituted together with the AV device capable of the bidirectional communication among the devices was shown in Fig. 4 and Fig. 5, the AV devices can be controlled with the quite same screen operation in this example.

[0032] The AV device equipped with the communication function described above may be so called an AV device capable of an unsophisticated bidirectional communication, which can bidirectionally exchanges data with an intelligent AV remote controller, and cannot perform a communication with other AV devices. When a system is constituted by this AV device capable of the unsophisticated bidirectional communication and the intelligent AV remote controller, a system constitution appears to be quite the same as that of Fig. 6. The system constitution is configured so that the communication between the AV device and the intelligent AV remote controller includes all of the contents shown in Fig. 3, and only the exchange of data among the AV devices is impossible.

[0033] It is possible to constitute a system, in which the AV device capable of the bidirectional communication, the AV capable of the unsophisticated bidirectional communication, and the AV device which is incapable of the bidirectional communication or do not perform the bidirectional communication are mixed and used as AV devices on a controlled side. Thus, even when the user buys a new AV device capable of the bidirectional communication, the user needs not to replace the conventional AV device with

this new one, and can continue to use the conventional AV device in this system. At this time, a display unit of the intelligent AV remote controller may show what communication the AV device can perform, or alternatively the display unit thereof needs not show it. In the case where the display unit thereof shows it, the user can know that a range where the intelligent AV remote controller can control the AV device is limited. In the case where the display unit thereof does not show it, the user can manipulate the intelligent AV remote controller to some extent even when the user does not have knowledge of the bidirectional communication, and even when user does not know what communication function is in the possession of an AV device which constitutes the system.

[0034] Furthermore, in Fig. 4 to Fig. 6, a conventional cable for propagating a voice and an image information may be connected between the AV devices or between the AV device and the intelligent AV remote controller. This is effective means when it is difficult to transmit and receive the voice and the video data with the communication function of this system for the reason of a burden on a time, a quality and hardware.

[0035] Then, in Fig. 4 to Fig. 6, by providing an interpreter, which converts the form of the script, in each of the AV devices or the outside thereof, it is possible to allow the system to possess a feature that the communication between the AV devices dealing with scripts having different forms and between the AV device and the intelligent AV remote controller is enabled. Furthermore, when the foregoing interpreter is incorporated in one certain AV device or the interpreter is solely provided, and when the system is configured to perform the communication between the AV devices or between the AV device and the intelligent AV remote controller via the AV device or the interpreter, other AV devices and the intelligent AV remote controller can perform the communication mutually with each other without providing the interpreter therein.

[0036] Next, an example of the user interface of the intelligent AV remote controller will be shown. The feature of the user interface of the intelligent AV remote controller is as follows. Specifically, it is possible to set a plurality of methods to perform a certain manipulation of the AV device. The user interface can be easily understood through intuition by using metaphor. User's convenience can be achieved by displaying various kinds of

information simultaneously. A screen display can be changed in accordance with requirement of the user.

[0037] Fig. 7 shows an example of an initial screen of the intelligent AV remote controller. Fig. 7 is a display example when responses from the television 701, the stereo 702, the video (1) (video deck) 703, the video (2) (video movie) 704, and the LD player 705 are respectively made as a result of a transmission of an AV device confirmation command from the intelligent AV remote controller through the communication means. Note that the respective AV devise illustrated here shall be capable of communicating with other AV devices and the intelligent AV remote controller bidirecitionally.

[0038] On this screen, icons other than those of the time 706 and the help button 707 show ones which have been sent as data from the respective AV devices to the intelligent AV remote controller. Note that the icons may assign data originally possessed by the intelligent AV remote controller based on a type of the AV device. Furthermore, though the name of the AV device under the icon is one obtained by assigning the device name originally stored in the intelligent AV remote controller based on data sent from the respective AV devices, the name of the AV device may be data such as a product name, which has been sent from each AV device. Various data concerning the respective AV devices, which has been once transmitted, is stored in a storage device such as a memory and a hard disc by the intelligent AV remote controller. This memory may be permanent, or may be deleted at the time of the operation completion of the intelligent AV remote controller caused by a predetermined operation.

[0039] Furthermore, the help button 707 is always displayed on the screen, and the manipulation and setting of the intelligent AV remote controller and the explanation of the manipulation method other than manipulation of the AV device are used if necessary. However, the details will be described later. The screen may always display the time 706, and the user may set that the time 706 is always displayed. To display the time 706 is useful at the time a timer recording of the video is set.

[0040] Fig. 8 is a block diagram of an example of an initial screen of Fig. 7 above described. Though the intelligent AV remote controller 801 is the same as that which has been described until now, the pen 802 as external input means and the speaker 803 as voice output means are respectively provided

in the intelligent AV remote controller 801. As an AV device on the controlled side, the stereo 805, the LD player 806, the VTR (1) (video deck) 807 and the VTR (2) (video camera) 808 are in a state where they are capable of communicating with the intelligent AV remote controller 801 via the television 804. Specifically, they are in the same state as that shown in Fig. 5.

[0041] Next, the case where the intelligent AV remote controller comes to be incapable of receiving a response from the AV device which has been confirmed to exist will be described. In order to use the intelligent AV remote controller for the same purpose as that of an ordinary remote controller, the user often moves while carrying it. As a result, there is a possibility that the intelligent AV remote controller and the AV device comes to be incapable of communicating with each other. This case is as follows, for example. Specifically, the intelligent AV remote controller and the AV device perform communications by radio, and radio waves, infrared ray and the like as the means of the wireless communication come to be incapable of reaching each of them. Therefore, the intelligent AV remote controller confirms that the intelligent AV remote controller is in a state where it is capable of communicating with the AV device and how each of the AV devices operates at present, at regular time intervals or when a predetermined operation is performed.

[0042] Fig. 9 is an example of a block diagram in the case where no response from the AV device which has been confirmed to exist is made, as described above. In the example shown in Fig. 9, the VTR (2) 808 comes to be incapable of communicating with the intelligent AV remote controller 801 for the above described reason or the like in the foregoing example of the device constitution shown in Fig. 8, and the VTR (2) 908 is in a state where it cannot communicate with any of the devices. The intelligent AV remote controller 901, the pen 902, the speaker 903, the television 904, the stereo 905, the LD player 906 and the VTR (1) 907 are the same as the intelligent AV remote controller 801, the pen 802, the speaker 803, the television 804, the stereo 805, the LD player 806 and the VTR (1) 807 of Fig. 8, respectively, and in the same states as those of them of Fig. 8.

[0043] Fig. 10 shows how the foregoing states of Fig. 9 are reflected on the display of the screen of the intelligent AV remote controller. In the display example of the screen of Fig. 10, the situation in which no response from the

video (2) (video movie) 1004 which is the same as the VTR (2) 908 of Fig. 9 is made and a communication comes to be incapable for some reason or other is notified to the user visually by marking the symbol × on the icon of the video (2). By allowing the intelligent AV remote controller to possess such function, it is possible to resolve fret about no response of the AV device when the button is depressed, which is apt to occur in using the conventional remote controller. At this time, by displaying the countermeasure on the screen of the intelligent AV remote controller, it is possible to reduce annoyance of the user. Incidentally, the television 1001, the stereo 1002, the video (1) 1003, the LD player 1005, the time 1006 and the help button 1007 of Fig. 10 are the same as the television 701, the stereo 702, the video (1) 703, the LD player 705, the time 706 and the help button 707 of Fig. 7, respectively.

[0044] Fig. 11 shows a display example of the screen in the case where the AV device is operated actually on the screen of the intelligent AV remote controller, and here shows an example of manipulation when playback of the video (1) is performed. The icon of the video (1) 703 of Fig. 7, which is an initial screen, is selected by a predetermined pointing device such as a pen, a mouse and a finger. In a state where the icon of the video (1) 703 is selected, this selected icon is overlapped on an icon of the television 701 in which a playback screen is wished to be displayed. Upon overlapping the icon of the selected icon, the icon of the television becomes a selected state, and a series of operations performed by the user is shown to be effective.

[0045] The icon of the 1101 in Fig. 11 indicates that a further selected state is brought about (shown by hatching in the drawing) with the icon of the video (1) being overlapped on the television as described above. In the portion where the icon of the video (1) has been originally displayed, a thing like a shadow 1103 of the video (1) is displayed as shown in Fig. 11, and this can clearly demonstrate that the video (1) is moved from the original position. As a matter of course, the shadow 1103 of the video (1) needs not to be displayed. Furthermore, an operation in which this video deck is incorporated in the television is metaphor that the video is displayed on the television, and a merit that the remote controller of the embodiment is very intuitively and easily understood compared to the conventional remote controller is brought about. By this operation of the user, a script describing the operation is sent from the intelligent AV remote controller to the AV device corresponding to

the video (1). Note that the stereo 1102, the video (2) 1104, the LD player 1105, the time 1106 and the help button 1107 of Fig. 11 are respectively the same as the stereo 702, the video (2) 704, the LD player 705, the time 706 and the help button 707 of Fig. 7.

[0046] Fig. 12 is an example of the display screen of the intelligent AV remote controller when the metaphor as described in Fig. 11 is not used. When the icon of the video (1) 703 of Fig. 7, which is an initial screen, is only selected by the predetermined pointing device such as the finger and the pen, a window 1208 for a manipulation of the video (1) 703 is opened. The respective icons of the television 701, the stereo 702, the video (1) 703, the video (2) 704 and the LD player 705 are redrawn with sizes and at positions where they are not hidden by the manipulation window 1208 of the video (1). Thus, these icons become respectively like the television 1202, the stereo 1203, the video (1) 1201, the video (2) 1204 and the LD player 1205, and the icon 1201 of the video (1) becomes in a selection state, that is, the icon is in a hatched state in this drawing.

[0047] In the manipulation window 1208 of the video (1), icons of the title 1209 of the window, the present tape counter 1210, the fast rewind button 1211, the play button 1212, the fast forward button 1213, the pause button 1214, the stop button 1215, the button 1216 for performing recording at once and the timer programmed recording 1217 are displayed. Therefore, when the play button 1212 is selected by the pointing device such as the pen and the finger, the playback of the video (1) starts.

[0048] In the example of Fig. 12, since only the television exists as an object for displaying the screen, the playback screen of the video (1) is automatically displayed on the television. If there are the plurality of televisions, a window for selecting the object to display the playback screen of the video (1) may be opened. By adopting such system, it is possible to imitate the way how to operate the conventional remote controller and AV device on the intelligent AV remote controller, and an effect that the user is not perplexed in using the intelligent AV remote controller is brought about. In order to visually express which AV device has the window 1208, a thing like the trace 1218 of the opened window may be displayed. With such system, it is possible to visually grasp what window is opened, without reading the title 1209 of the window.

[0049] Fig. 13 is an example of the display screen of the intelligent AV remote

controller when the playback of the video deck corresponding to the video (1) using the procedure shown in Fig. 11 and Fig. 12 is performed. In these drawings, the video (1) 1301, the television 1302, the stereo 1304, the video (2) 1305 and the LD player 1306 are the same as the video (1) 703, the television 701, the stereo 702, the video (2) 704 and the LD player 705 of Fig. 7, respectively. Furthermore, this example shows a state where the manipulation window 1310 of the video (1) is opened so as to be capable of performing the manipulation of the video (1) at once. Similarly, also the sound level manipulation window 1309 is opened so as to be capable of controlling the sound level of the television.

[0050] The user can easily know the operation state of the present video (1) by displaying the character 1311 expressing that the operation state is in course of playback and the play button with the selected state 1314 in the manipulation window 1310 of the video (1). At this time, by displaying the tape counter 1312 of the video (1), the user can know the remaining amount of the video tape without coming near the video deck. Furthermore, by displaying the present sound level numerically as well as the adjustment button in the sound level adjustment window 1309, the user can use this displaying as a guide to the sound level adjustment.

[0051] On the other hand, among the icons of the AV devices, the video (1) 1310 and the television 1302 are selected, that is, they are hatched. This shows that the video (1) and the television are in operation at present. Furthermore, the speaker 1303 is displayed beside the television. This shows that sound is comes out at present. By operating the icon 1303 of the speaker, it is possible to emit voice of the video (1) 1301 from other AV devices or emit no voice of the television 1302. Furthermore, a selection window of an AV device emitting voice is displayed at the time of starting a video playback, and the user may select this. When there are a plurality of devices displaying the image, a window for selecting this and an icon expressing an image display may be provided similarly to the icon 1303 of the speaker.

[0052] In the window 1310 of the video 1, the fast rewind button 1313, the play button 1314, the fast forward button 1315, the pause button 1316, the stop button 1317, the button 1318 for performing the recording at once and the timer programmed button 1319 are the same as the fast rewind button 1211, the play button 1212, the fast forward button 1213, the pause button

1214, the stop button 1215, the button 1216 for performing the recording at once and the timer programmed button 1217 of Fig. 12. Similarly, the time 1307 and the help button 1308 are the same as the time 706 and the help button 707 of Fig. 7.

[0053] Fig. 14 is an example of the display screen of the intelligent AV remote controller when the timer programmed recording setting of the video is performed. In Fig. 14, the video (1) 1401, the television 1402, the stereo 1403, the video (2) 1404 and the LD player 1405 are the same as the video (1) 703, the television 701, the stereo 702, the video (2) 704 and the LD player 705 of Fig. 7. In the example shown in Fig. 14, the window 1409 for making a recording schedule of the video (1) is opened, and this schedule programming window 1409 is opened when the user selects the schedule programming icon 1217 in the manipulation window 1208 of the video (1) of Fig. 12. In order to display this on the screen, in the bottom right 1408 of the schedule programming window 1409, a state is displayed where the foregoing schedule programming icon 1217 of Fig. 12, which is hatched in this drawing, is selected.

[0054] There are two large areas in the foregoing schedule programming window 1409. One is the area 1410 for displaying a situation where the schedule programming is done at present, and the other is the area 1411 for new schedule programming. In the former area 1410, a day, a recording start time, a recording finish time and a channel are described. In the latter area 1411, a display for selecting a day, a recording staring time, a recording finish time and a channel is displayed. However, the remote controller of the present invention differs largely from the conventional remote controller in that it is possible to directly write a day, a time and the like, at which the schedule programming is intended to be performed, on the screen by use of the pointing device such as the pen, the mouse and the finger used in the intelligent AV remote controller. The written numeric characters are character-recognized. Furthermore, after entered line drawing is deleted, entering data may be displayed by printing type newly. Thus, the user can confirm whether the entering done by himself/herself is effective or not. Furthermore, in order to make the entering simple, the mechanism 1412 for switching a designation of a day and a designation of a day of the week or morning and afternoon with one touch can be provided. Effect never change

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even by adopting the form in which the characters are not set by writing them on the screen, but desired one among from the day, the day of the week, the time and the channel, which are already displayed in the form of a table, is selected.

[0055] Furthermore, in the schedule programming window 1409 of the video (1) 1, there are the button 1413 for canceling the schedule programming and the button 1414 for finish, so as to make the cancel of the schedule programming and the finish easy. Note that the time 1406 and the help button 1407 are the same as the time 706 and the help button 707 of Fig. 7.

[0056] Fig. 15 is one example of the display screen of the intelligent AV remote controller when a channel is selected for viewing the television. Fig. 15 is the example of the screen display when the icon 701 of the television is selected by a predetermined pointing device in Fig. 7 showing the initial screen of the intelligent AV remote controller. Therefore, the icon 1502 of the television is in a state where it is selected, that is, in a state where it is hatched in this drawing. In this example shown in Fig. 15, the window 1508 having the same role as that of the window 1309 for adjusting the sound level of the television of Fig. 13 and the window 1509 for selecting the channel of the television are opened.

[0057] In the window 1509 for selecting the channel, the one having the same appearance as that of the conventional remote controller is displayed, and a way how to use it, it is sufficient to select a desired channel (for example, 1510) by a predetermined pointing device. Thus, usability of it is not lower than that of the conventional remote controller. At this time, in the channel button like 1510, it is possible to provide facilities for the user by displaying the name of the TV station distinctively from the numerical characters showing the channel. The name of the TV station may be one previously stored in the intelligent AV remote controller, and may one set by a predetermined operation by the user.

[0058] Furthermore, as one feature of the intelligent AV remote controller, a possibility that an image and voice data are received from the device by use of a communication is enumerated. In Fig. 15, by selecting the area 1511 in which the words "display on this screen" in the window 1509 for channel setting by a predetermined pointing device, the feature can be utilized. In other words, when the foregoing area 1511 is selected, the image and voice

signals are sent to the intelligent AV remote controller from the television, and the television can be viewed on the intelligent AV remote controller. At this time, the display unit 102 of the intelligent AV remote controller of Fig. 1 is used for the image display, and the voice output unit 105 of the intelligent AV remote controller is used for the voice output.

[0059] In the example of the system constitution, since each of the AV devices and the intelligent AV remote controller can communicate with each other, there is an effect that it is possible to view the television program on the intelligent AV remote controller even in a place where no television exists as long as the intelligent AV remote controller can communicate with any of the AV devices. At this time, the image and the voice are transmitted by the foregoing communication means in the order: from the television to the AV device; and from the AV device to the intelligent AV remote controller. States of the image and the voice data transmitted in such a way may be any of compressed and uncompressed ones. When they are compressed, though software or hardware for compressing is required for the AV device, and though software or hardware for decoding is required for the intelligent AV remote controller, there is a merit that a transmission time of the image and the voice data between the AV device and the intelligent AV remote controller is short. Furthermore, when they are uncompressed, there is a merit that circuit constitutions of the AV device and the intelligent AV remote controller are simpler compared to those when they are compressed.

[0060] By providing a capture function in the intelligent AV remote controller, in which the television screen is stored by an instruction of the user and the television screen is continued to be displayed until a next instruction of the user, it is possible to provide facilities to the user even when information which the user wish acquire carefully is comes out. For the memory of the television screen at this time, a storage device provided in the intelligent AV remote controller or a storage device provided outside the intelligent AV remote controller can be used.

[0061] Note that in Fig. 15, the video (1) 1501, the television 1502, the stereo 1503, the video (2) 1504, the LD player 1505, the time 1506 and the help button 1507 are the same as the video (1) 703, the television 701, the stereo 702, the video (2) 704, the LD player 705, the time 705 and the help button 707 of Fig. 7, respectively.

[0062] Fig. 16 is an example when the television program is viewed on the intelligent AV remote controller. Herein, in order to make it easier to display the television screen, the intelligent AV remote controller is horizontally oriented. On the screen of the intelligent AV remote controller, the television screen 1604, the time 1603, the volume setting window 1601, the channel selection window 1602, the television view cancel button 1605 and the help button 1606 are displayed.

[0063] The volume setting window 1601 is the same as the volume setting window 1309 of Fig. 13, and by selecting a button in the channel selection window 1602 with a predetermined pointing device, a channel which is wished to be viewed can be freely changed. At this time, in addition to the button to change the channel, facilities may be provided to the user by displaying a channel number of a TV station which is currently being displayed on the intelligent AV remote controller. Then, when the cancel button 1605 is selected in a state of Fig. 16, the screen of the intelligent AV remote controller returns to the state of Fig. 7 or Fig. 15. In addition to these, by displaying optional information such as operation situations of other AV devices, the control of the AV device can be easily performed. Note that in Fig. 16, the time 1603 and the help button 1606 are the same as the time 706 and the help button 707 of Fig. 7, respectively.

[0064] Fig. 17 is an example of the screen display when the help button is selected on the initial screen of the intelligent AV remote controller of Fig. 7. In the lower right of the screen in this example, the help button 1707 is currently selected, that is, the help button 1707 is in a hatched state on this screen. Furthermore, since the help button 1707 is selected, the window 1708 for setting is also opened. Areas for explaining a manipulation method of the intelligent AV remote controller, setting of the television channel and the TV station and other settings are displayed in the setting window 1708, and when the selection is performed by the predetermined pointing device as described above, windows for these will also be opened. To complete this manipulation, a finish button can be displayed in this window 1708. With such constitution, the user can manipulate the setting of the television channel which has been troublesome in the conventional system, and by providing a similar help button for setting the television channel, the user can refer to an instruction manual directly on the screen when the user does not

know an operational procedure. Accordingly, the intelligent AV remote controller is very multifunctional compared to the conventional remote controller, and can be simplified.

[0065] In Fig. 17, the video (1) 1701, the television 1702, the stereo 1703, the video (2) 1704, the LD player 1705 and the time 1706 play the same role as those of the video (1) 703, the television 701, the stereo 702, the video (2) 704, the LD player 705 and the time 706 of Fig. 7, respectively.

[0066] As described above, the intelligent AV remote controller has a feature that it can process the data displayed on the screen. Therefore, for the convenience of the user's use, the icons can be arranged on the screen freely, and the screen can be rotated optionally as shown in Fig. 16. It is possible to provide convenience to the user.

[0067] When the power source of the intelligent AV remote controller is cut by a predetermined operation, or when the user performs a predetermined operation, the intelligent AV remote controller may transmit a command and script of power source cutting to the respective AV devices. Thus, by cutting the power source of the intelligent AV remote controller, power sources of all of the AV devices communicating with the intelligent AV remote controller can be cut at a time. Accordingly, the user can collectively manage the power sources of all of the AV devices without complicated manipulations.

[0068] Herein, when the plurality of intelligent AV remote controller exist, it is expected that an instruction and a script, which have different contents respectively, are transmitted to the same AV device from the respective intelligent AV remote controllers. In order to avoid this, priorities are assigned to the plurality of intelligent AV remote controller by the user's manipulation, and when the AV device receives instruction and the like which cannot exist simultaneously, the AV device accepts the instruction from the intelligent AV remote controller having a higher priority. It is possible to prevent an operation content of the AV device from changing rapidly and an erroneous operation of the AV device.

[0069]

[Effects of the Invention] As described above, according to the present invention, the system is constituted of the intelligent AV remote controller or the personal digital assistance, and the AV device which has communication means similar to that of the intelligent AV remote controller or the personal

digital assistance, and which can mutually exchange the script, that is, the instruction and the information in the language form based on the specified grammar by this communication means, and thus, the user can control simply and collectively the AV device. By providing the interpreter, which interprets and generates the script, in the outside of the intelligent AV remote controller or the personal digital assistance, it is possible to obtain the effect that the instruction and the information can be mutually transmitted between the intelligent AV remote controller or the personal digital assistance and the AV device, which deal with different forms of the script.

[0070] By performing various processings for the instruction and the information obtained by the intelligent AV remote controller or the personal digital assistance by the foregoing method, an user interface corresponding to various cases can be constructed, and it is possible to provide facilities for the user as circumstances demand.

[0071] In the constitution of the intelligent AV remote controller or the personal digital assistance according to the present invention, when the image signal in a compressed or uncompressed state is transmitted from the AV device to the intelligent AV remote controller or the personal digital assistance in addition to the foregoing script, there is an effect that the image signal can be seen on the screen of the intelligent AV remote controller or the personal digital assistance. At this time, by providing the internal speaker or the voice output terminal in the intelligent AV remote terminal or the personal digital assistance, it is possible to obtain a feature that the user can listen to the voice in the compressed or uncompressed state, which has been transmitted thereto together with the image signal. Furthermore, the image or the voice signal in the compressed state, which has been transmitted thereto, is temporarily stored in the storage device incorporated in the intelligent AV remote controller or the personal digital assistance or connected to the outside thereof, whereby an effect appears in which it is possible for the intelligent AV remote controller or the personal digital assistance having no function of decoding it in real time to take a countermeasure.

[0072] The intelligent AV remote controller or the personal digital assistance of the present invention can control the AV device which can be controlled by the conventional remote controller. Accordingly, an effect is exhibited, in

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which the user needs not to buy a new AV device when the user uses the intelligent AV remote controller or the personal digital assistance.

[0073] By providing a function in the intelligent AV remote controller or the personal digital assistance, in which an instantaneous image and voice are stored and they are continuously reproduced, even when the user is suddenly motivated by necessity to retain information of the television or the like, the user can satisfy the need quickly and simply.

[Brief Description of the Drawings]

[Figure 1] Fig. 1 is a block diagram showing a constitution of an intelligent AV remote controller according to an embodiment of the present invention.

[Figure 2] Fig. 2 is a perspective view showing an example of an appearance of the intelligent AV remote controller according to the embodiment of the present invention.

[Figure 3] Fig. 3 is an explanatory view showing an example of a content communicated between an AV device and the intelligent AV remote controller according to the embodiment of the present invention.

[Figure 4] Fig. 4 is a view of a system constitution constituted by the AV devices and the intelligent AV remote controller according to the embodiment of the present invention when the AV devices communicate with the intelligent AV remote controller individually, and when the AV devices communicate with each other.

[Figure 5] Fig. 5 is a view of a system constitution constituted by the AV devices and the intelligent AV remote controller according to the embodiment of the present invention when the AV device communicates with a television, or when the television communicates with the intelligent AV remote controller (when the AV device communicates with the intelligent AV remote controller via the television).

[Figure 6] Fig. 6 is a view of a system constitution constituted by the AV devices and the intelligent AV remote controller according to the embodiment of the present invention when the AV devices communicates with the intelligent AV remote controller individually, and when the AV devices do not communicate with each other,

[Figure 7] Fig. 7 is an explanatory view showing an example of an initial screen displayed in the intelligent AV remote controller according to the embodiment of the present invention.

[Figure 8] Fig. 8 is a view of a system constitution showing one example of a device constitution when the screen of Fig. 7 is displayed.

[Figure 9] Fig. 9 is a view of a system constitution showing a state where a communication between a video (2) and the intelligent AV remote controller becomes unable in Fig. 8.

[Figure 10] Fig. 10 is an explanatory view showing one example of a display screen of the intelligent AV remote controller in a state shown in Fig. 9.

[Figure 11] Fig. 11 is an explanatory view showing one example of a display screen of the intelligent AV remote controller when a playback of a video (1) is performed in Fig. 7.

[Figure 12] Fig. 12 is an explanatory view showing another example of a display screen of the intelligent AV remote controller when a playback of a video (1) is performed in Fig. 7.

[Figure 13] Fig. 13 is an explanatory view showing one example of a display screen of the intelligent AV remote controller when a playback of the video (1) was performed in Fig. 11 and Fig. 12.

[Figure 14] Fig. 14 is an explanatory view showing one example of a display screen of the intelligent AV remote controller when a timer programmed recording of the video (1) was performed in Fig. 12.

[Figure 15] Fig. 15 is an explanatory view showing one example of a display screen of the intelligent AV remote controller when a television channel is selected in Fig. 7.

[Figure 16] Fig. 16 is an explanatory view showing one example of a display screen of the intelligent AV remote controller when a television channel wished to be viewed is selected, and when a screen of the selected channel is displayed on the intelligent AV remote controller in Fig. 15.

[Figure 17] Fig. 17 is an explanatory view showing one example of a display screen of the intelligent AV remote controller when a help button is selected in Fig. 7 and other drawings.

[Explanations of Reference Numerals]

101 control unit of intelligent AV remote controller

102 display unit of intelligent AV remote controller

103 communication unit of intelligent AV remote controller

104 input unit of intelligent AV remote controller

105 voice output unit of intelligent AV remote controller

106 storage unit of intelligent AV remote controller

201 input-cum-display unit of intelligent AV remote controller

202, 203, 204 communication interface of intelligent AV remote controller

205, 206 voice output unit of intelligent AV remote controller

303A, 303B, 303C content of communication between intelligent AV remote controller and AV device

402, 403, 502, 503, 602, 603, 802, 902 input means provided outside intelligent AV remote controller

404, 405, 406, 504, 505, 506, 604, 605, 606, 803, 903 voice output means provided outside intelligent AV remote controller

701 to 705, 1001 to 1005, 1101 to 1105, 1201 to 1205, 1301 to 1306, 1401 to 1405, 1501 to 1505, 1701 to 1705 icon of AV device displayed on intelligent AV remote controller

1208, 1310, 1409 video manipulation window

1309, 1508, 1601 sound level adjustment window

1509, 1602 channel manipulation window of television

1708 help window displayed when help button is selected

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FIG. 1

CONSTITUTION EXAMPLE OF INTELLIGENT AV REMOTE CONTROLLER (FIG. 1)

   102   DISPLAY UNIT

      LIQUID CRYSTAL

      BRAUN TUBE

   101   CONTROL UNIT

   103   COMMUNICATION UNIT

    INFRARED RAY

     RADIO WAVE

     CABLE

   104   INPUT UNIT

     TOUCH PANEL

     MOUSE

     PEN

     MICROPHONE

  105   VOICE OUTPUT UNIT

    SPEAKER

  VOICE OUTPUT TERMINAL

     (EAR PHONE, HEAD PHONE AND THE LIKE)

  106   STORAGE UNIT

    MEMORY

     HARD DISC

FIGURE 2

  EXAMPLE OF APPEARANCE OF INTELLIGENT AV REMOTE CONTROLLER (FIG. 2)

   201   LIQUID CRYSTAL DISPLAY-CUM-TOUCH PANEL

 202   INFRARED INTERFACE

 203   RADIO WAVE INTERFACE

 204   CABLE CONNECTOR

  205   EAR PHONE JACK

 206 SPEAKER

FIGURE 3

COMMUNICATION BETWEEN INTELLIGENT AV REMOTE CONTROLLER AND AV DEVICE (FIG. 3)

301 INTELLIGENT AV REMOTE CONTROLLER

302 AV DEVICE

303A AV DEVICE CONFIRMATION COMMAND
(OR SCRIPT)
DEVICE ID
ICON DATA
SCRIPT AND DATA OF OPERABLE OBJECT

303B OBJECT DEVICE ID
OBJECTIVE OBJECT
EXECUTION SCRIPT AND DATA
IMAGE/VOICE DATA
STATUS INDICATING PRESENT SITUATION
(OR SCRIPT)

303C COUNTERMEASURE SCRIPT
STATUS INDICATING OCCURRENCE OF ABNORMALITY
(OR SCRIPT)
SCRIPT FOR COUNTERMEASURE

FIGURE 4

EXAMPLE OF SYSTEM CONSTITUTION (1)

(EXAMPLE IN WHICH AV DEVICES COMMUNICATE INDIVIDUALLY WITH INTELLIGENT AV REMOTE CONTROLLER) (FIG. 4)

CONTROLLED SIDE

409 STEREO 410 LD

408 TV 411 OTHER AV DEVICES

407 VTR

402 MOUSE 403 PEN 401 INTELLIGENT AV REMOTE CONTROLLER

EXTERNAL INPUT MEANS

404 HEAD PHONE 405 EAR PHONE

405 EAR PHONE

VOICE EXTERNAL OUTPUT MEANS 406 SPEAKER

FIG. 5

EXAMPLE OF SYSTEM CONSTITUTION (2)

(EXAMPLE IN WHICH AV DEVICES COMMUNICATE WITH INTELLIGENT AV REMOTE CONTROLLER VIA TV) (FIG. 5)

508   STEREO 509   LD   510   VTR   511   OTHER AV DEVICES

507   TV

CONTROLLED SIDE

502   MOUSE   503 PEN   EXTERNAL INPUT MEANS

501 INTELLIGENT AV REMOTE CONTROLLER

504   HEAD PHONE   505   EAR PHONE   VOICE EXTERNAL OUTPUT MEANS

506   SPEAKER

FIG. 6

EXAMPLE OF SYSTEM CONSTITUTION (3)   (EXAMPLE IN WHICH AV DEVICES COMMUNICATE INDIVIDUALLY WITH INTELLIGENT AV REMOTE CONTROLLER) (FIG. 6)

CONTROLLED SIDE

607   STEREO 608 TV   609   VTR   610 LD   611 OTHER AV DEVICES

602 MOUSE 603   PEN   EXTERNAL INPUT MEANS

601   INTELLIGENT AV REMOTE CONTROLLER

604   HEAD PHONE 605 EAR PHONE 606   SPEAKER
VOCE EXTERNAL OUTPUT MEANS

FIG. 7

EXAMPLE OF USER INTERFACE (INITIAL SCREEN) (FIG. 7)

701   TELEVISION   702   STEREO   703   VIDEO 1
704   VIDEO 2

FIG. 8

EXAMPLE OF SYSTEM CONSTITUTION (FIG. 8)

805　　STEREO　806　LD　807　VTR 1　808　VTR 2

804　　TV
　　　CONTROLLED SIDE
　　802　　PEN　　　801　　　INTELLIGENT AV REMOTE CONTROLLER
　　EXTERNAL INPUT MEANS
　　　803　SPEAKER
　　VOICE EXTERNAL OUTPUT MEANS

FIG. 9
EXAMPLE OF DEVICE CONSTITUTION IN WHICH RECOGNITION BECOMES IMPOSSIBLE AT SOME MIDPOINT) (FIG. 9)
903　STEREO　905　LD　907　VTR 1　908　VTR 2
　904 TV
CONTROLLED SIDE
902　PEN
　EXTERNAL INPUT MEANS
　901　　INTELLIGENT AV REMOTE CONTROLLER
　903　SPEAKER
　　VOICE EXTERNAL OUTPUT MEANS

FIG. 10
EXAMPLE OF USER INTERFACE (EXAMPLE WHEN RECOGNITION BECOMES IMPOSSIBLE AT SOME MIDPOINT) (FIG. 10)
　1001　TELEVISION　1002　STEREO　1003　VIDEO 1
1004 VIDEO 2
　1005　LD

FIG. 11
EXAMPLE OF USER INTERFACE (EXAMPLE WHEN VIDEO PLAYBACK STARTS) (FIG. 11)
　1101　TELEVISION　1102　STEREO　1103 VIDEO 1　1104 VIDEO 2
　1105　LD

FIG. 12

EXAMPLE OF USER INTERFACE (ANOTHER EXAMPLE OF VIDEO PLAYBACK) (FIG. 12)

1211   FAST REWIND   1212   PLAY   1213   FAST FORWARD
1214   PAUSE   1215   STOP   1216   IMMEDIATE RECORDING
1217   TIMER PROGRAMMED 1201   VIDEO 1   1202 TELEVISION
1203   STEREO   1204   VIDEO 2   1205   LD

FIG. 13

EXAMPLE   OF   USER   INTERFACE   (EXAMPLE   IN   VIDEO REPRODUCTION)   (FIG. 13)

1309   SOUND LEVEL OF TELEVISION

1310   VIDEO 1

1311   PLAYING

1313   FAST REWIND   1314 PLAY   1315   FAST FORWARD   1316
PAUSE   1317   STOP   1318   IMMEDIATE RECORDING   1319
TIMER PROGRAMMED   1301   VIDEO 1   1302   TELEVISION
1304   STEREO   1305   VIDEO 2   1306   LD

FIG. 14

EXAMPLE OF USER INTERFACE (EXAMPLE OF VIDEO TIMER PROGRAMMED RECORDING) (FIG. 14)

1409   TIMER PROGRAMMED RECORDING OF VIDEO 1

START   FINISH

EVERY SATURDAY

MONTH   DAY

AM   HOUR   MINUTE

PM   HOUR   MINUTE

1413   CANCEL   1414 FINISH

1401   VIDEO 1   1402   TELEVISION

1403   STEREO   1404   VIDEO 2

1405   LD

FIG. 15

EXAMPLE OF USER INTERFACE (EXAMPLE IN VIEWING TELEVISION) (FIG. 15)

1508   SOUND LEVEL OF TELEVISION

TELEVISION

1511   DISPLAY ON THIS SCREEN

1501   VIDEO 1   1502   TELEVISION   1503   STEREO   1504 VIDEO 2   1505   LD

FIG. 16

EXAMPLE OF USER INTERFACE (EXAMPLE WHEN TELEVISION SCREEN IS DIRECTLY VIEWED) (FIG. 16)

1601   SOUND LEVEL

CHANNEL

1605   DISMISS

FIG. 17

EXAMPLE OF USER INTERFACE (EXAMPLE OF HELP/SETTING SCREEN) (FIG. 17)

SETTING ETC

EXPLANATION OF MANIPULATION METHOD

SETTING OF TV CHANNEL

OTHER SETTINGS

END

1701   VIDEO 1

1702   TELEVISION

1703   STEREO

1704   VIDEO 2

1705   LD

Fig.1

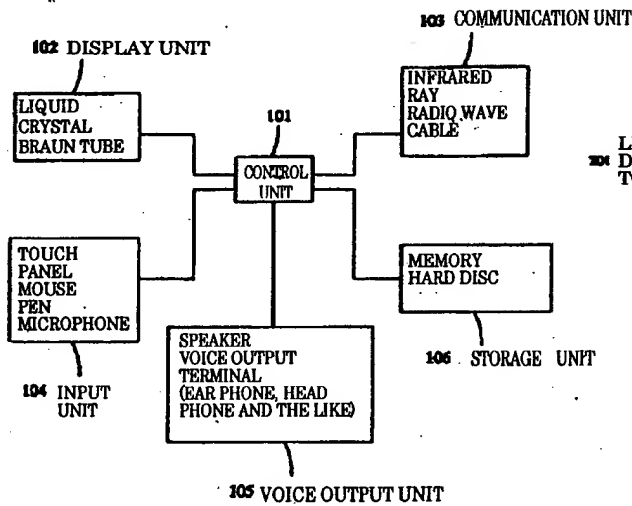CONSTITUTION EXAMPLE OF INTELLIGENT
AV REMOTE CONTROLLER (FIG. 1)

102 DISPLAY UNIT

103 COMMUNICATION UNIT

LIQUID CRYSTAL BRAUN TUBE

101 CONTROL UNIT

INFRARED RAY RADIO WAVE CABLE

TOUCH PANEL MOUSE PEN MICROPHONE

104 INPUT UNIT

MEMORY HARD DISC

106 STORAGE UNIT

SPEAKER VOICE OUTPUT TERMINAL (EAR PHONE, HEAD PHONE AND THE LIKE)

105 VOICE OUTPUT UNIT

Fig.2

EXAMPLE OF APPEARANCE OF INTELLIGENT AV
REMOTE CONTROLLER (FIG. 2)

RADIO WAVE 203 INTERFACE

202 INFRARED INTERFACE

206 SPEAKER

LIQUID CRYSTAL 204 DISPLAY·CUM· TOUCH PANEL
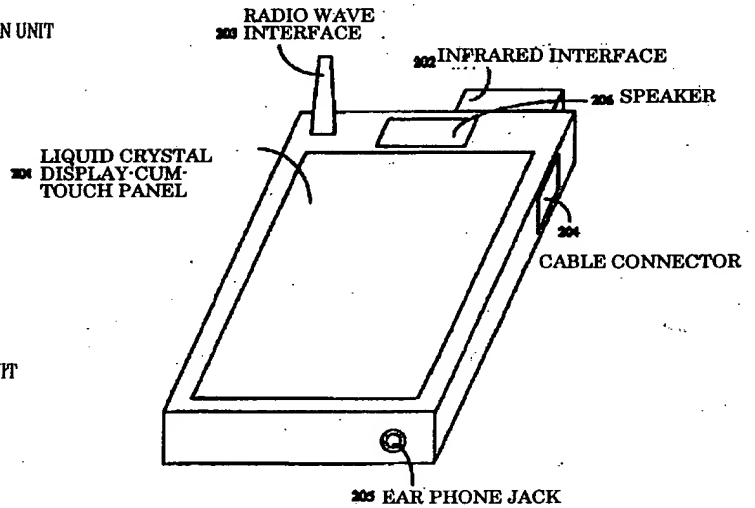
201 CABLE CONNECTOR

205 EAR PHONE JACK

Fig.5

EXAMPLE OF SYSTEM CONSTITUTION (2)
(EXAMPLE IN WHICH AV DEVICES
COMMUNICATE WITH INTELLIGENT AV
REMOTE CONTROLLER VIA TV) (FIG. 5)

508 STEREO

509 LD

510 VTR

511 OTHER AV DEVICES

CONTROLLED SIDE

507 TV

502 MOUSE

INTELLIGENT AV REMOTE CONTROLLER 501

503 PEN

EXTERNAL INPUT MEANS

504 HEAD PHONE

505 EAR PHONE

506 SPEAKER

VOICE EXTERNAL OUTPUT MEANS

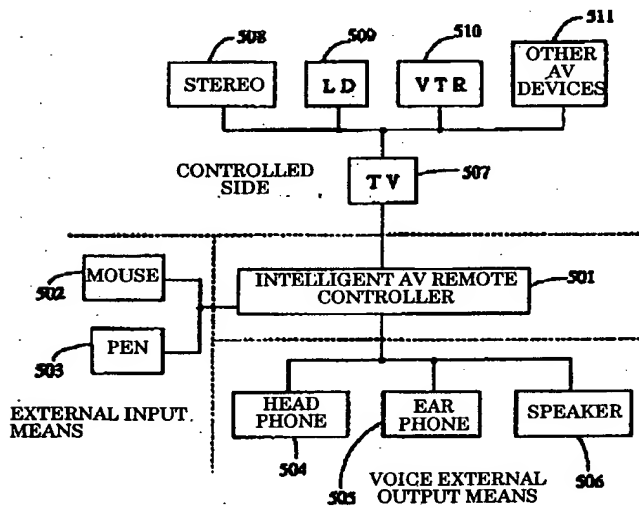## Fig.6

EXAMPLE OF SYSTEM CONSTITUTION (3)
(EXAMPLE IN WHICH AV DEVICES
COMMUNICATE INDIVIDUALLY WITH
INTELLIGENT AV REMOTE CONTROLLER)
(FIG. 6)

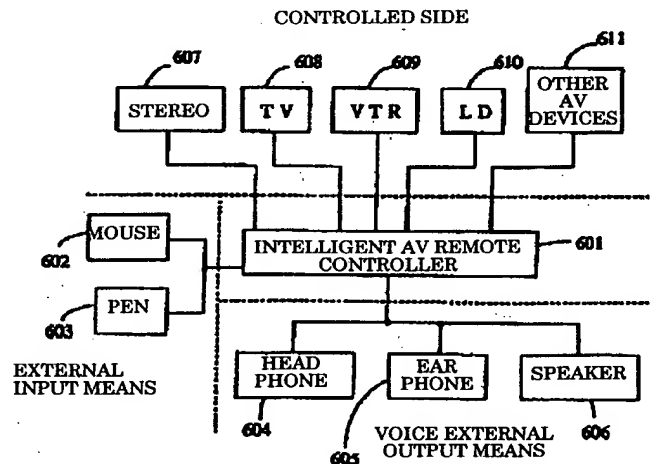CONTROLLED SIDE

607 STEREO

608 TV

609 VTR

610 LD

611 OTHER AV DEVICES

602 MOUSE

INTELLIGENT AV REMOTE CONTROLLER 601

603 PEN

EXTERNAL INPUT MEANS

604 HEAD PHONE

605 EAR PHONE

606 SPEAKER

VOICE EXTERNAL OUTPUT MEANS

Fig.3
COMMUNICATION BETWEEN INTELLIGENT AV REMOTE CONTROLLER AND AV DEVICE (FIG. 3)

301 — **INTELLIGENT AV REMOTE CONTROLLER**

303A
| AV DEVICE CONFIRMATION COMMAND (OR SCRIPT) | DEVICE ID ICON DATA SCRIPT AND DATA OF OPERABLE OBJECT |

303B
| OBJECT DEVICE ID OBJECTIVE OBJECT EXECUTION SCRIPT AND DATA | IMAGE/VOICE DATA STATUS INDICATING PRESENT SITUATION (OR SCRIPT) |

303C
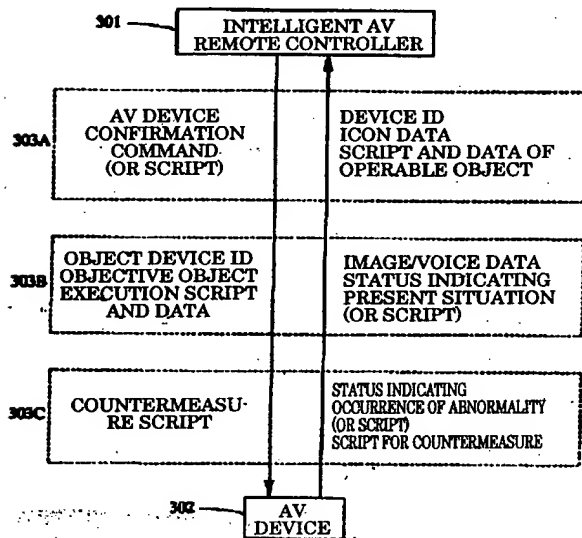| COUNTERMEASURE SCRIPT | STATUS INDICATING OCCURRENCE OF ABNORMALITY (OR SCRIPT) SCRIPT FOR COUNTERMEASURE |

302 — **AV DEVICE**

Fig.4
EXAMPLE OF SYSTEM CONSTITUTION (1) (EXAMPLE IN WHICH AV DEVICES COMMUNICATE INDIVIDUALLY WITH INTELLIGENT AV REMOTE CONTROLLER) (FIG. 4)
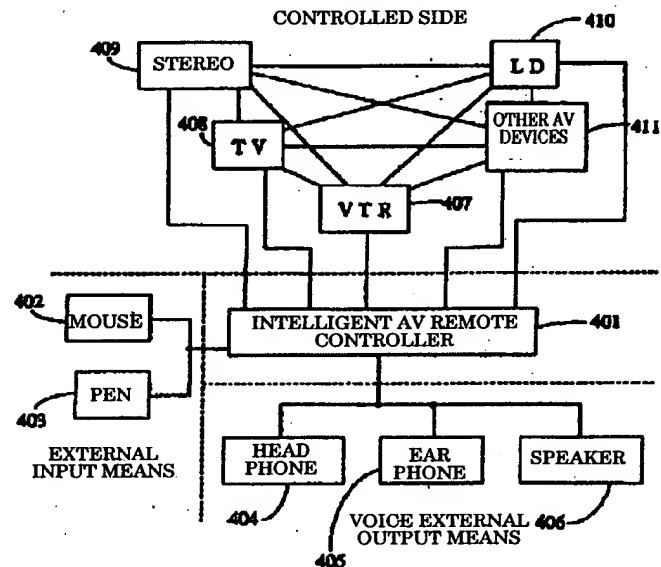
CONTROLLED SIDE

409 — STEREO   LD — 410

408 — TV   OTHER AV DEVICES — 411

VTR — 407

402 — MOUSE

INTELLIGENT AV REMOTE CONTROLLER — 401

PEN
403

EXTERNAL INPUT MEANS

HEAD PHONE   EAR PHONE   SPEAKER

404   405   406

VOICE EXTERNAL OUTPUT MEANS

Fig.7
EXAMPLE OF USER INTERFACE (INITIAL SCREEN) (FIG. 7)

706 — AM9:50:45

703 — VIDEO 1

701 — TELEVISION

704 — VIDEO 2

702 — STEREO

705 — LD

707 — ?

Fig.8
EXAMPLE OF SYSTEM CONSTITUTION (FIG. 8)

805 — STEREO   806 — LD   807 — VTR 1   808 — VTR 2

CONTROLLED SIDE   TV — 804

PEN — 802

INTELLIGENT AV REMOTE CONTROLLER — 801

EXTERNAL INPUT MEANS

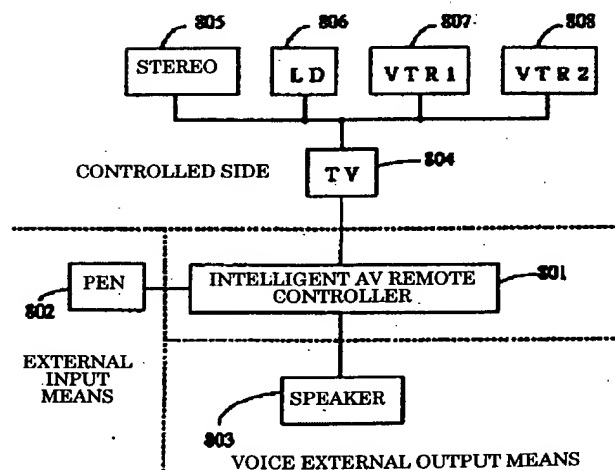803 — SPEAKER

VOICE EXTERNAL OUTPUT MEANS

Fig.9

EXAMPLE OF DEVICE CONSTITUTION IN WHICH RECOGNITION BECOMES IMPOSSIBLE AT SOME MIDPOINT) (FIG. 9)
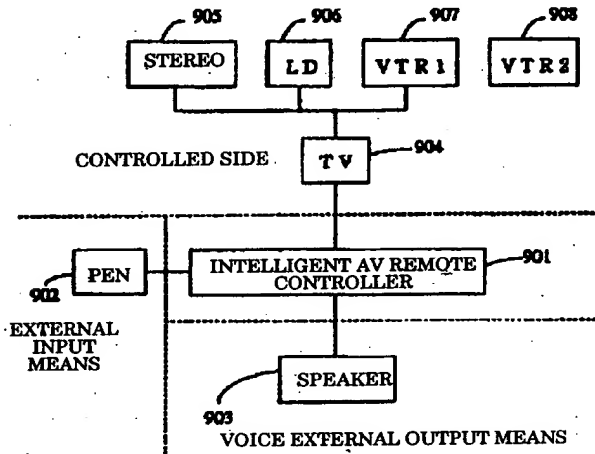

Fig.10

EXAMPLE OF USER INTERFACE (EXAMPLE WHEN RECOGNITION BECOMES IMPOSSIBLE AT SOME MIDPOINT) (FIG. 10)
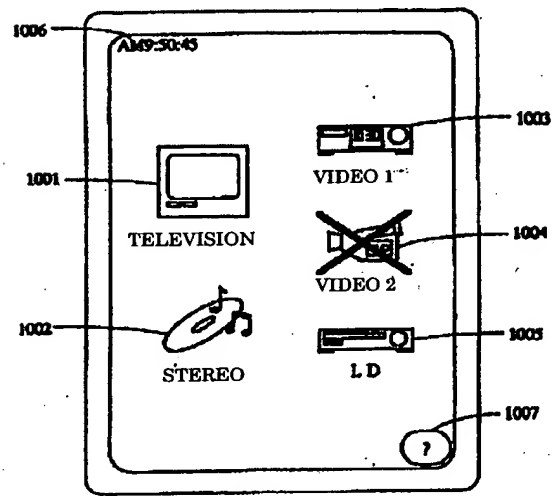

Fig.11

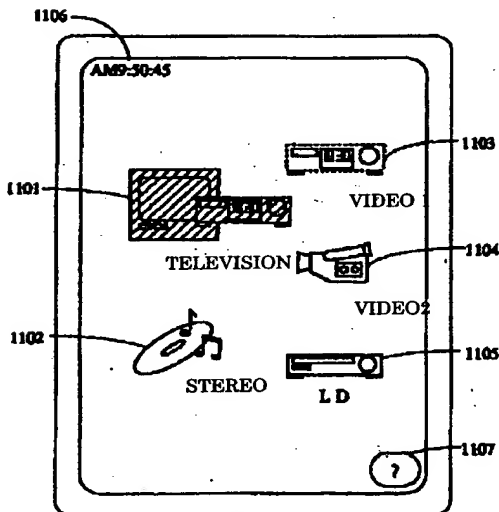EXAMPLE OF USER INTERFACE (EXAMPLE WHEN VIDEO PLAYBACK STARTS) (FIG. 11)

Fig.12

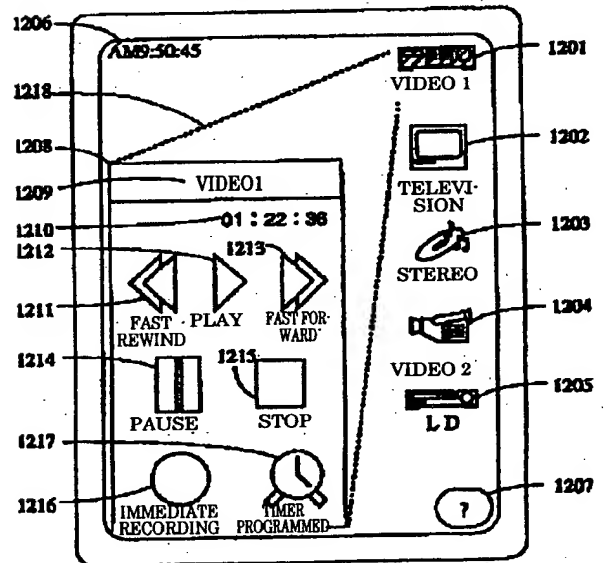EXAMPLE OF USER INTERFACE (ANOTHER EXAMPLE OF VIDEO PLAYBACK) (FIG. 12)

Fig.13
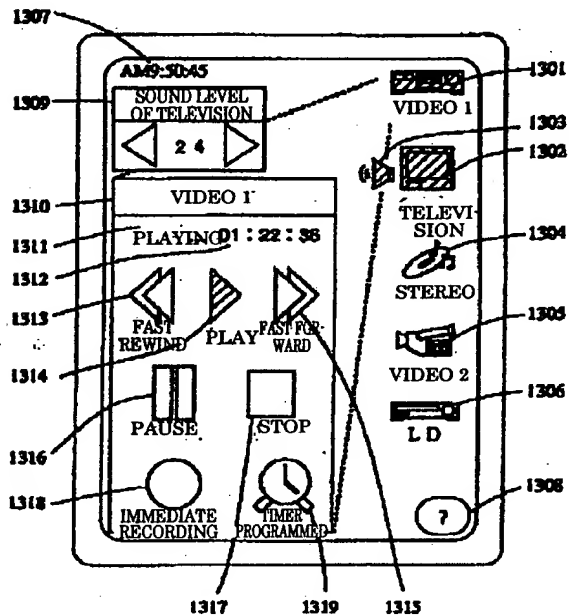### EXAMPLE OF USER INTERFACE
(EXAMPLE IN VIDEO REPRODUCTION)
(FIG. 13)

1307

AM9:50:45 ——1301

1309
SOUND LEVEL
OF TELEVISION
VIDEO 1

◀ 2 4 ▶ ——1303

1302

1310
VIDEO 1
TELEVI-
SION ——1304

1311
PLAYING01 : 22 : 36

1312
STEREO

1313
◁ ▷ ▷ ——1305
FAST
REWIND PLAY FAST FOR-
WARD
VIDEO 2

1314
——1306

PAUSE STOP L D

1316

1318
IMMEDIATE
RECORDING TIMER
PROGRAMMED ——1308

?

1317   1319   1315

Fig.14
EXAMPLE OF USER INTERFACE
(EXAMPLE OF VIDEO TIMER
PROGRAMMED   RECORDING) (FIG. 14)

1406

AM9:50:45 ——1401

1409
TIMER PROGRAMMED
RECORDING OF VIDEO 1
VIDEO 1

START   FINISH   c h ——1402

12/24 PM5:30 PM6:00   8
TELEVI-
SION

1410
1/2 AM9:00 AM10:00   3

EVERY PM6:30 PM7:00   12 ——1403
SATURDAY
STEREO

1411
▼ MONTH   DAY ——1404

1412
▼ AM HOUR MINUTE VIDEO 2

↓ ——1405

1413
▼ AM HOUR MINUTE L D

CANCEL   FINISH

? ——1407

1414   1408

Fig.15
EXAMPLE OF USER INTERFACE
(EXAMPLE IN VIEWING TELEVISION)
(FIG. 15)

1506

AM9:50:45 ——1501

1508
SOUND LEVEL OF
TELEVISION
VIDEO 1

◀ 2 4 ▶ ——1502

TELEVISION
TELEVI-
SION ——1503

1509
1   2   3

STEREO

1510
4   5   6 ——1504

VIDEO 2

7   8   9 ——1505
L D

10 11 12

DISPLAY ON
THIS SCREEN ——1507

1511   ?

Fig.16
EXAMPLE OF USER INTERFACE
(EXAMPLE WHEN TELEVISION SCREEN
IS DIRECTLY VIEWED) (FIG. 16)

1603   1601

AM9:50:45

SOUND
LEVEL

1604
△
2 4
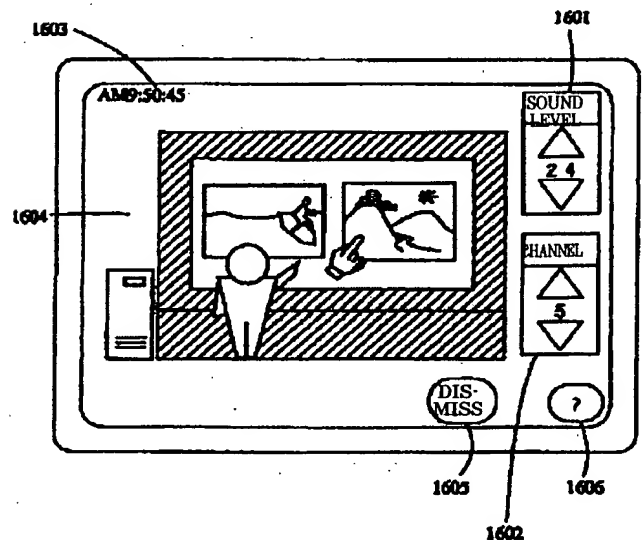▽

CHANNEL

△
5
▽

DIS-
MISS ?

1605   1606

1602

Fig.17

EXAMPLE OF USER INTERFACE
(EXAMPLE OF HELP/SETTING SCREEN)
(FIG. 17)